Application No. 10/667,004 Amendment dated May 2, 2008 After Allowance Under 37 C.F.R. 1.312 Docket No.: 21058/1206448-US1 Intel Corporation

AMENDMENTS TO THE CLAIMS

LISTING OF CLAIMS:

a)

1. (Previously presented) A method comprising:

obtaining a plurality of coded probes, each of the coded probes comprising a probe

molecule attached to at least one nano-barcode, and at least two of the coded probes comprise two

or more identifiably different nano-barcodes that can generate different detectable signals, wherein

the nano-barcode is selected from the group consisting of carbon nanotubes, fullerenes,

submicrometer metallic barcodes, nanoparticles, quantum dots, combinations thereof, and the nano-

barcode made from nano-tag elements;

b) contacting one or more target molecules with the coded probes, wherein the coded

probes comprise oligonucleotides and bind to different locations on the target molecules;

c) ligating the coded probes that are adjacent one another on the target molecules to

form ligated coded probes and aligning the ligated coded probes on a substrate surface by molecular

combing using microfluidic channels and forming organized coded probes, wherein the ligated

coded probes are aligned in the direction of the microfluidic flow in the microfluidic channels;

d) identifying the organized coded probes; and

e) detecting the one or more target molecules based on the organized coded probes.

2. (Canceled)

Application No. 10/667,004 Amendment dated May 2, 2008 After Allowance Under 37 C.F.R. 1.312 Docket No.: 21058/1206448-US1

Intel Corporation

3. (Currently amended) The method of claim $\underline{1}$, wherein the target molecule is a nucleic

acid.

4. (Previously Presented) The method of claim 3, further comprising contacting a library of

coded probes comprising all possible sequences for a particular length of oligonucleotide with the

one or more target molecules.

5. (Canceled)

6. (Original) The method of claim 3, wherein the nucleic acid is attached to a surface.

7. (Canceled)

8. (Previously Presented) The method of claim 3, further comprising separating the ligated

coded probes from the nucleic acid and non-ligated coded probes.

9. (Canceled)

10. (Previously Presented) The method of claim 1, wherein the organized coded probes are

identified by scanning probe microscopy.

Application No. 10/667,004 Docket No.: 21058/1206448-US1
Amendment dated May 2, 2008 Intel Corporation

After Allowance Under 37 C.F.R. 1.312

11. (Previously Presented) The method of claim 1, wherein the organized coded probes are

identified by an equipment selected from the group consisting of atomic force microscopy, scanning

tunneling microscopy, lateral force microscopy, chemical force microscopy, force modulation

imaging microscopy, magnetic force microscopy, high frequency magnetic force microscopy,

magnetoresistive sensitivity mapping microscopy, electric force microscopy, scanning capacitance

microscopy, scanning spreading resistance microscopy, tunneling atomic force microscopy and

conductive atomic force microscopy.

12. (Previously Presented) The method of claim 1, wherein the organized coded probes

aligned on the substrate surface are identified by scanning probe microscopy.

13. (Previously Presented) The method of claim 3, further comprising determining the

sequences of the oligonucleotides that hybridize to the nucleic acid.

14. (Previously Presented) The method of claim 13, further comprising determining the

sequence of the nucleic acid based on the sequences of oligonucleotides that hybridize to the nucleic

acid.

15. (Previously Presented) The method of claim 3, further comprising identifying the

nucleic acid based on the coded probes that hybridize to the nucleic acid.

Application No. 10/667,004 Docket No.: 21058/1206448-US1
Amendment dated May 2, 2008 Intel Corporation

After Allowance Under 37 C.F.R. 1.312

16. (Previously Presented) The method of claim 1, wherein the target molecule is a protein,

a peptide, a glycoprotein, a lipoprotein, a nucleic acid, a polynucleotide, or an oligonucleotide.

17. (Previously Presented) The method of claim 16, wherein two or more target molecules

are present in a sample and the target molecules in the sample are analyzed at the same time.

18. (Previously Presented) The method of claim 16, wherein two or more target molecules

are present in a sample and the target molecules of the same type are analyzed at the same time.

19. (Previously presented) A method comprising:

a) obtaining a plurality of coded probes, each of the coded probes comprising a probe

molecule attached to at least one nano-barcode, and at least two of the coded probes comprise two

or more identifiably different nano-barcodes that can generate different detectable signals, wherein

the nano-barcode is selected from the group consisting of carbon nanotubes, fullerenes,

submicrometer metallic barcodes, nanoparticles, quantum dots, combinations thereof, and the nano-

barcode made from nano-tag elements;

b) contacting one or more target molecules with the coded probes, wherein one or more

of the coded probes bind to different locations on the target molecules and the coded probes

comprise oligonucleotides;

c) ligating the coded probes that are adjacent one another on the target molecules to

form ligated coded probes and aligning the ligated coded probes on a substrate surface by molecular

Application No. 10/667,004 Amendment dated May 2, 2008

After Allowance Under 37 C.F.R. 1.312

Docket No.: 21058/1206448-US1

Intel Corporation

combing using microfluidic channels and forming aligned coded probes, wherein the ligated coded

probes are aligned in the direction of microfluidic flow in the microfluidic channels;

d) identifying the aligned coded probes using scanning probe microscopy; and

e) detecting the one or more target molecules based on the aligned coded probes.

20. (Canceled)

21. (Previously Presented) The method of claim 19, wherein the scanning probe microscopy

is selected from the group consisting of atomic force microscopy, scanning tunneling microscopy,

lateral force microscopy, chemical force microscopy, magnetic force microscopy, high frequency.

magnetic force microscopy, electric force microscopy, scanning capacitance microscopy, scanning

spreading resistance microscopy, tunneling atomic force microscopy and conductive atomic force

microscopy.

22. (Original) The method of claim 19, wherein the target molecule is a nucleic acid.

23. (Previously Presented) The method of claim 22, further comprising determining at least

part of the sequence of the nucleic acid based on the aligned coded probes.

24. (Previously Presented) The method of claim 19, further comprising separating the bound

coded probes from the target molecules after the coded probes are aligned on a surface.

Application No. 10/667,004 Amendment dated May 2, 2008

After Allowance Under 37 C.F.R. 1.312

25-28. (Canceled)

29. (Previously Presented) The method of claim 1, wherein the coded probes are

Docket No.: 21058/1206448-US1

Intel Corporation

further aligned on the substrate surface by free flow electrophoresis.

30. (Previously Presented) The method of claim 19, wherein the coded probes are

further aligned on the substrate surface by free flow electrophoresis.

31. (Previously presented) A method comprising:

obtaining a plurality of coded probes, each of the coded probes comprising a probe a)

molecule attached to at least one nano-barcode, and at least two of the coded probes comprise two

or more identifiably different nano-barcodes that can generate different detectable signals, wherein

the nano-barcode is selected from the group consisting of carbon nanotubes, fullerenes,

submicrometer metallic barcodes, nanoparticles, quantum dots, combinations thereof, and the nano-

barcode made from nano-tag elements;

contacting one or more target molecules with the coded probes and forming binding b)

complexes, wherein the coded probes comprise oligonucleotides;

aligning the coded of the binding complexes on a surface by free flow c)

electrophoresis and forming organized coded probes;

identifying the organized coded probes; and d)

detecting the one or more target molecules based on the organized coded probes. e)

Application No. 10/667,004 Docket No.: 21058/1206448-US1
Amendment dated May 2, 2008 Intel Corporation

After Allowance Under 37 C.F.R. 1.312

32. (Previously presented) A method comprising:

a) obtaining a plurality of coded probes, each of the coded probes comprising a probe

molecule attached to at least one nano-barcode, and at least two of the coded probes comprise two

or more identifiably different nano-barcodes that can generate different detectable signals, wherein

the nano-barcode is selected from the group consisting of carbon nanotubes, fullerenes,

submicrometer metallic barcodes, nanoparticles, quantum dots, combinations thereof, and the nano-

barcode made from nano-tag elements;

b) contacting one or more target molecules with the coded probes, wherein one or more

coded probes bind to the target molecules and forming binding complexes, wherein the coded

probes comprise oligonucleotides;

c) aligning the coded probes of the binding complexes on a surface by free flow

electrophoresis and forming aligned coded probes;

d) identifying the aligned coded probes using scanning probe microscopy; and

e) detecting the one or more target molecules based on the aligned coded probes.